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Symptomatic Monostotic Fibrous Dysplasia of the Thoracic Spine

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Study Design. A case report of monostotic fibrous dysplasia of the thoracic spine with symptoms of chest and back pain.

Objective. To treat this lesion with surgery.

Summary of Background Data. Monostotic fibrous dysplasia of the thoracic spine is rarely seen. Few reports of this disorder appear in the literature. This is the fifth case of monostotic fibrous dysplasia of the thoracic spine presented to date.

Methods. The patient was a 48-year-old woman with monostotic fibrous dysplasia involving the thoracic spine of the 10th vertebral body and the 10th left rib. Surgical removal of the tumor was carried out. The defect was packed with hydroxyapatite graft material. Arthrodesis or internal fixation was not made.

Results. The diagnosis of fibrous dysplasia was made histlogically. No obvious recurrence of the lesion has been seen for 3 years.

Conclusion. Surgical removal of the tumor and transplantation of hydroxyapatite was effective treatment for the reported patient. [Key words: fibrous dysplasia, hydroxyapatite, thoracic spine] **Spine 1998;23:741–743**

Only four cases of monostotic fibrous dysplasia of the thoracic spine have been reported.[3–5,7] This is the fifth reported case of fibrous dysplasia involving the left 10th thoracic vertebra and the 10th left rib. Radiographic examination indicated a tumor at the left 10th thoracic vertebral level, which was symptomatic. The fibrous dysplasia was completely removed to avoid a recurrence. Complete resection of the tumor was carried out, and the bone defect was packed with hydroxyapatite. Arthrodesis was not made. Results of histologic study of the lesion demonstrated fibrous dysplasia. Fibrous dysplasia is regarded as a benign bone tumor and may involve any part of the skeleton.[1,2,8] But the spine, especially the thoracic section, is rarely affected.

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Case Report

The patient was a 48-year-old woman with acute onset of chest and back pain. She consulted her family doctor. A chest radiograph showed an expanding lesion involving the left 10th rib and 10th thoracic vertebra. The patient was referred to the authors' department. She had no family or personal medical history of spinal disorders. Physical examination showed no abnormalities. There was mild pain in the lumbar region. Blood and chemical analysis data were normal.

Radiographic films showed a solitary lesion of the left 10th rib and 10th thoracic vertebra, with thin cortex, and osteolytic and bubble-like in appearance (Figure 1). Computed tomographic scans showed a high-density borderline between the normal vertebral body and the lesion involving the 10th vertebral body, pedicle, lamina, and rib, connecting with the spinal canal (Figure 2). Magnetic resonance images disclosed the high-signal intensity of the 10th body in the gadolinium-enhanced, T1-weighted image, indicating a mass that had not perforated the spinal canal (Figure 3). Bone scintigram confirmed a lesion of the 10th thoracic vertebra. The patient underwent computed tomographic-guided fine-needle biopsy of the 10th vertebral body. Fibrous dysplasia, ossifying fibroma, or a giant cell tumor was suspected in the results of histologic examination.

An angiogram showed a hypovascular lesion. A diagnosis of fibrous dysplasia was made before surgery.

In December 1994, 7 months after the onset of pain, the patient underwent an operation. A midline incision from the 8th to the 11th thoracic vertebra was made, with the patient prone. A transverse incision was made parallel to the border of left rib, and the perivertebral muscles were severed to expose the left 10th rib. A left hemilaminectomy and costotransversectomy was performed. The mass was completely removed from the 10th vertebral body and left 10th rib. The border between the tumor and normal tissue was apparent. The tumor was fibrous and avascularized, and it perforated into the spinal canal. The defect was packed with hydroxyapatite (BONFIL granule, Mitsubishi Material, Japan) as a bone substitute. This implant was bioactive and fabricated from pure hydroxyapatite material. Because the defect was small, it was packed only with hydroxyapatite (Figure 5).

Histologic study of the lesion showed fibrous dysplasia (Figure 4), using hematoxylin–eosin staining. Microscopic examination showed proliferation of fibroblasts, which produced a dense collagenous matrix. The fibrous element typically contained trabeculae of osteoid and bone. Rimming osteoblasts of the trabecular bone were inconspicuous. Some giant cells were

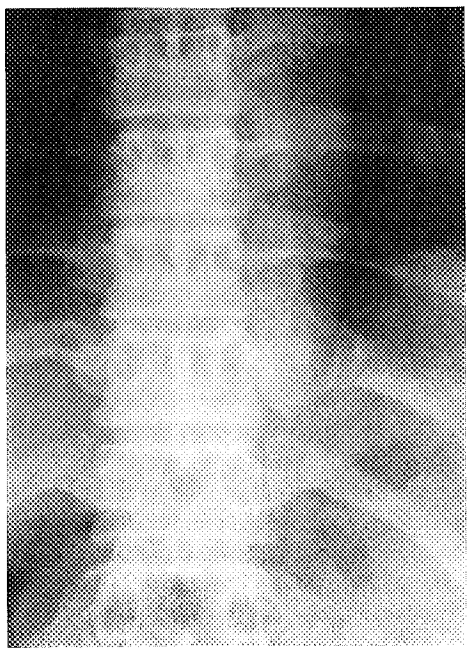

Figure 1. Plain radiograph of the thoracic spine showing an osteolytic, bubble-like lesion.

dispersed. After surgery, the patient used a Taylor brace for 2 months.

Three years later, the patient was asymptomatic and radiographic film showed no obvious recurrence of the lesion or pathologic fractures.

■ Discussion

Fibrous dysplasia is regarded as a benign bone tumor. It is a relatively common fibro-osseous, monostotic or polyostotic, sharply delimited pathologic abnormality of the bone of unknown cause.[1,2,8] Polyostotic fibrous dysplasia may be an indication of Albright's syndrome.[1,2,8] Monostotic fibrous dysplasia frequently shows lesional distribution in the ribs, jaw, skull, or long bones.[1] Monostotic fibrous dysplasia is rarely encountered in the spine, especially in the thoracic spine. Only four cases of monostotic fibrous dysplasia of the thoracic spine appear in the literature.[3–5,7]

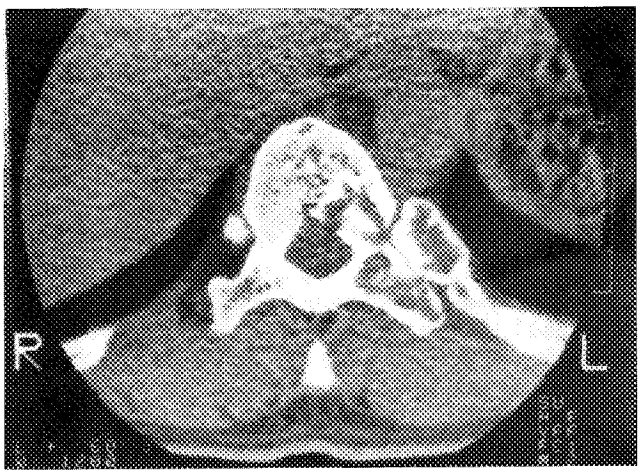

Figure 2. Computed tomographic scan. High-density borderline between the normal vertebral body and the lesion was shown.

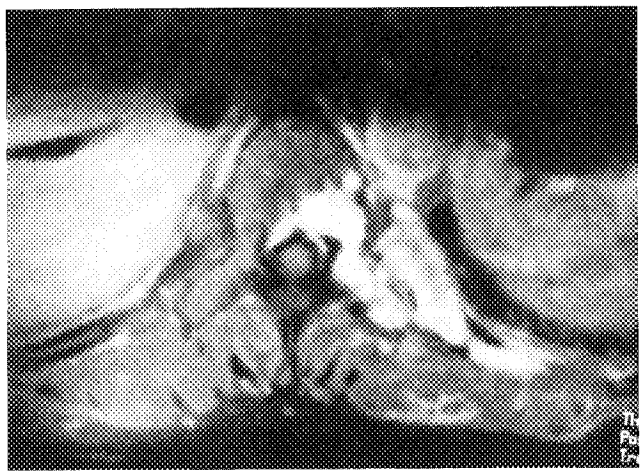

Figure 3. Axial gadolinium–diethylene-triamine pentaacetic acid-enhanced magnetic resonance image showing no displacement of the spinal cord.

The mass was diagnosed histologically as fibrous dysplasia. It consisted of disorganized bony trabeculae within collagenized fibrous tissue. There was no osteoblastic rimming, and in the absence of this feature, the lesion differed histologically from a fibrous design of ossifying fibroma. Giant cells were very few. A better needle biopsy of the tumor would have facilitated the diagnosis. By a better biopsy, a larger specimen should have been obtained.

The clinical presentation of monostotic fibrous dysplasia is usually painless and asymptomatic, and it is often discovered accidentally on radiographic film.[5] However, the tumor may be symptomatic because of nerve root compression without pathologic fractures.

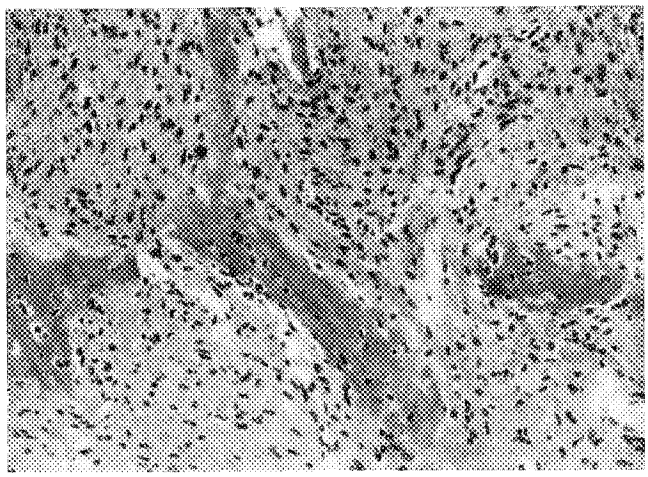

Figure 4. Photomicrograph of the vertebral region. The tumor consisted of disorganized bony trabeculae within collagenized fibrous tissue. Rimming osteoblasts are inconspicuous (hematoxylin–eosin; magnification, ×320).

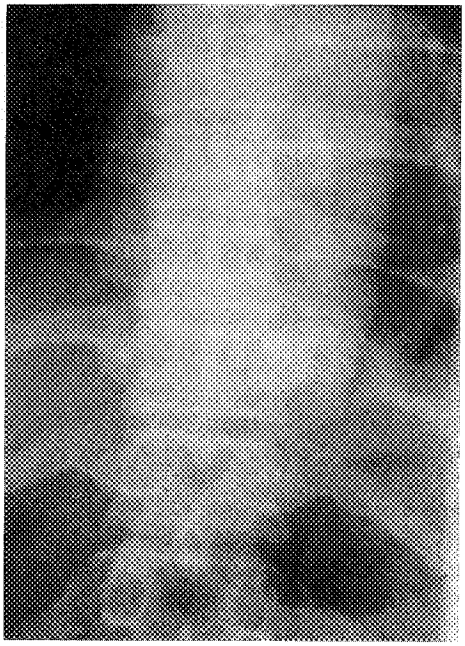

Figure 5. Plain radiograph of the thoracic spine after the operation, showing the incorporation of hydroxyapatite.

The current patient had chest and back pain. After surgery, the pain was regarded as intercostal neuralgia caused by mechanical compression by the tumor.

Combined anterior and posterior surgery and fusion are sometimes conducted for the management of neoplastic disease of the spine. Rosenblum et al[5] report a case involving T1. Through a posterior and anterior approach, they completely removed the mass and performed anterior fusion with an autogenous bone graft. Singer et al[7] report a case affecting T11. Their treatment was partial vertebrectomy of T11 with vascularized rib graft as well as posterior and anterior spinal fusion. Nabarro and Giblin[3] report a case involving T7. A combined anterior and posterior approach with fusion and tumor resection was the treatment, which was successful. In the defect, a rib graft and autogenous iliac crest bone were placed. Przybylski et al[4] performed surgery accompanied by internal fixation and bone grafting for the lesion in T5.

In the currently reported case, the tumor was completely removed. Arthrodesis was not made, because the lesion area of the vertebral body was small. Only the defect of bone was packed with hydroxyapatite. Although spinal fusion was not performed, the mechanical strength of the hydroxyapatite ensured spinal stability. Hydroxyapatite is considered sufficient as an alternative to autogenous graft material, owing to its chemical similarity to bone.[6,9] Radiographically, no obvious recurrence of the lesion and pathologic fractures have been seen for 3 years.

■ Conclusion

This report presents a case of fibrous dysplasia involving the thoracic spine, successfully treated by surgery, which involved resection of the tumor and placement of hydroxyapatite. Histologic evidence of fibrous dysplasia was noted after the operation.

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